

# Prevalence of Functional Dyspepsia Among General Population in Aseer Region: A Population-Based Study

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## ABSTRACT

**Study design:** Cross sectional

**Background:** Functional dyspepsia refers to a chronic condition characterized by persistent pain or discomfort in the upper abdomen, bloating, and fullness, which is often accompanied by an unpleasant sensation of satiety even after eating only small amounts of food. The causes of this condition are not yet fully understood, but it may result from a combination of biological, psychological, and environmental factors.

**Aim:** This study aims to assess prevalence of functional dyspepsia among general population in Aseer region, Southern of Saudi Arabia.

**Methods:** A descriptive cross-sectional study (survey-based study) was conducted in Aseer region, southern region, Saudi Arabia. The electronic survey made by Google forms during the period from March-2023 to June 2023. The study survey included questions that assess the prevalence, pattern and the effect of functional dyspepsia beside participants socio-demographic data and body mass index. The tool was uploaded online using social media platforms till no more answers were obtained.

**Results:** A total of 277 participants completed the study questionnaire. Participants ages ranged from 15 to more than 55 years with mean age of  $25.2 \pm 12.9$  years old. Exact of 157 (69.2%) were females. A total of 128 (56.4%) had FD of whom 93 (41%) had PDS, and 81 (35.7%) had EPS.

**Conclusion:** In conclusion, the current study estimated high prevalence for FD relative to estimated literature findings but mostly due to variability in used diagnostic criteria. Postprandial distress syndrome was more frequent than epigastric pain syndrome. Females showed higher rates of FD and subtypes than males with unemployment.

**Keywords:** Functional dyspepsia, Dyspepsia, Prevalence, Risk factors, Criteria, Saudi Arabia

## INTRODUCTION

Dyspepsia refers to group of upper gastrointestinal symptoms that commonly occur in adults<sup>1</sup>. This syndrome consists of epigastric pain, burning, fullness, discomfort, early satiety, nausea, vomiting and belching<sup>2-4</sup>. Dyspepsia is known to be caused by organic causes, but the majority of patients suffer from non-organic ulcer or Functional

dyspepsia<sup>5</sup>. Diagnosis of this syndrome is made by the upper endoscopy only if there is no structural abnormality. Recent studies showed the global prevalence of Functional Dyspepsia which vary between 11% - 29.2%<sup>6,7</sup>.

Functional dyspepsia refers to a chronic condition characterized by persistent pain or discomfort in the upper abdomen, bloating, and

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fullness, which is often accompanied by an unpleasant sensation of satiety even after eating only small amounts of food<sup>8</sup>. The causes of this condition are not yet fully understood, but it may result from a combination of biological, psychological, and environmental factors<sup>9</sup>. It is estimated that over 15% of people worldwide suffer from functional dyspepsia at some point in their lives<sup>10</sup>. Despite the common occurrence of this condition, treatment options remain limited and often focus on symptom relief rather than addressing the underlying causes. Regrettably, history and clinical examination cannot precisely differentiate functional dyspepsia from organic causes of dyspepsia<sup>11</sup>, with lack of accurate biomarker to ease the diagnosis. A validated diagnostic procedure not available, and neither the Rome committee nor present guidelines support routine laboratory testing in all patients<sup>12,13</sup>.

Limited data is available in Saudi Arabia regarding the prevalence of functional dyspepsia symptoms and its subtypes, as defined by Rome IV criteria. By this study we aim to estimate the prevalence of functional dyspepsia in the general population at Aseer region, Saudi Arabia.

## METHODOLOGY

A descriptive cross-sectional study (survey-based study) was conducted in Aseer region, southern region, Saudi Arabia to assess the prevalence of functional dyspepsia. The study included 277 participants who filled the study questionnaire. An online questionnaire that was constructed by the study authors after intensive literature review and expert's consultation was used for data collection. The electronic survey made by google forms who is less than 13 years old, incomplete answers, and who refused to participate were excluded. After taking informed consent, the survey included questions that assess the prevalence, pattern and the effect of functional dyspepsia beside participants socio-demographic data and body mass index. The tool was uploaded online using social media platforms till no more answers were obtained.

### Data Analysis

The data were collected, reviewed and then fed to Statistical Package for Social Sciences version 21 (SPSS: An IBM Company). All statistical methods used were two tailed with alpha level of 0.05 considering significance if P value less than or equal to 0.05. Regarding functional dyspepsia and its subtypes (Postprandial Distress Syndrome (PDS) and Epigastric Pain Syndrome (EPS)), it was detected according to ROM IV criteria. (1) Descriptive analysis was done by prescribing frequency distribution and percentage for study variables including participants personal data, employment and BMI. Prevalence of functional dyspepsia with subtypes were graphed. Cross tabulation for showing distribution of participants functional dyspepsia with subtypes by their personal data and other factors using Pearson chi-square test for significance and exact probability test if there were small frequency distributions.

## RESULTS

A total of 277 participants completed the study questionnaire. Participants ages ranged from 15 to more than 55 years with mean age of 25.2 ± 12.9 years old. Exact of 157 (69.2%) were females and 122 (53.7%) were single. As for education, 171 (75.3%) were university graduates, 36 (15.9%) as secondary education level and 18 (7.9%) were illiterate. Exact of 78 (34.4%) were employed. Considering their BMI, 127 (55.9%) had normal weight, 69 (30.4%) had overweight and 12 (5.3%) were obese.

**Table 1:** Socio-demographic data of study participants, Aseer region, Saudi Arabia

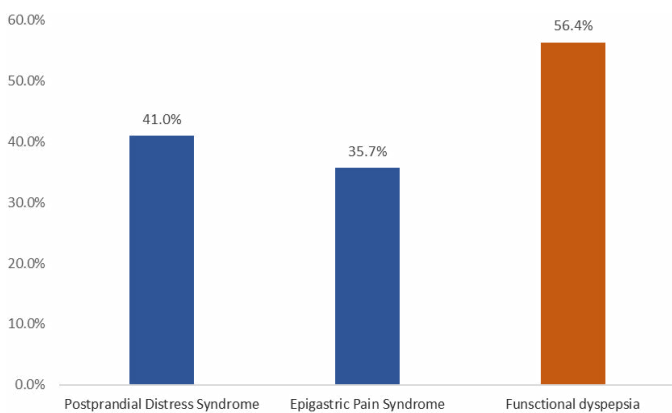
| Socio-demographic data    | No  | %     |
|---------------------------|-----|-------|
| <u>Age in years</u>       |     |       |
| 18-25                     | 111 | 48.9% |
| 26-35                     | 58  | 25.6% |
| 36-55                     | 33  | 14.5% |
| > 55                      | 25  | 11.0% |
| <u>Gender</u>             |     |       |
| Male                      | 70  | 30.8% |
| Female                    | 157 | 69.2% |
| <u>Education level</u>    |     |       |
| Elementary / Intermediate | 2   | .9%   |
| Secondary                 | 36  | 15.9% |
| University                | 171 | 75.3% |
| Illiterate                | 18  | 7.9%  |
| <u>Employment status</u>  |     |       |
| Employee                  | 78  | 34.4% |
| Unemployed                | 149 | 65.6% |
| <u>Marital status</u>     |     |       |
| Single                    | 122 | 53.7% |
| Married                   | 105 | 46.3% |
| <u>Body mass index</u>    |     |       |
| Underweight               | 19  | 8.4%  |
| Normal weight             | 127 | 55.9% |
| Overweight                | 69  | 30.4% |
| Obese                     | 12  | 5.3%  |

Table 2, ROM IV criteria for dyspepsia among study participants, Aseer region, Saudi Arabia. Exact of 86.3% of the study participants had feeling of fullness during last 6 months which affected their daily activities among 87 (44.4%) of them. Also, 80.2% had sensation of early satiety which lasted for 6 months among 74 (40.7%) of them. As for feeling of epigastric pain / burning sensation, it was reported among 76.2% of the study participants which was for last 6 months among 74 (42.8%) of them.

**Table 2:** ROM IV criteria for dyspepsia among study participants, Aseer region, Saudi Arabia

| ROM IV criteria   | No  | %     |
|---|-----|-------|
| <u>In the last 3 months, how often did you feel so full after a regular-sized meal (the amount you normally eat) that it interfered with your usual activities?</u>   |     |       |
| Never   | 31  | 13.7% |
| Less than one day a month   | 41  | 18.1% |
| One day a month   | 34  | 15.0% |
| Once a week   | 40  | 17.6% |
| Two to three days a week  | 62  | 27.3% |
| Most days   | 14  | 6.2%  |
| Every day   | 5   | 2.2%  |
| <u>Has it been 6 months or longer since you started having these episodes of fullness after meals that was severe enough to interfere with your usual activities?</u> |     |       |
| No  | 109 | 55.6% |
| Yes   | 87  | 44.4% |
| <u>In the last 3 months, how often were you unable to finish a regular-sized meal because you felt too full?</u>  |     |       |

|  |     |       |
|--|-----|-------|
| Never  | 45  | 19.8% |
| Less than one day a month  | 57  | 25.1% |
| One day a month  | 40  | 17.6% |
| Once a week  | 31  | 13.7% |
| Two to three days a week   | 41  | 18.1% |
| Most days  | 9   | 4.0%  |
| Every day  | 4   | 1.8%  |
| Has it been 6 months or longer since you started having these episodes of feeling too full to finish regular-sized meals?  |     |       |
| No   | 108 | 59.3% |
| Yes  | 74  | 40.7% |
| In the last 3 months, how often did you have pain or burning in the middle part of your upper abdomen (above your belly button but not in your chest), that was so severe that it interfered with your usual activities? |     |       |
| Never  | 54  | 23.8% |
| Less than one day a month  | 73  | 32.2% |
| One day a month  | 43  | 18.9% |
| Two to three days a week   | 42  | 18.5% |
| Most days  | 12  | 5.3%  |
| Every day  | 3   | 1.3%  |
| Has it been 6 months or longer since you started having this pain or burning in the middle part of your upper abdomen?   |     |       |
| No   | 99  | 57.2% |
| Yes  | 74  | 42.8% |



**Figure 1:**Prevalence of functional dyspepsia (PDS and EPS) in Aseer region, Saudi Arabia

A total of 128 (56.4%) had FD of whom 93 (41%) had PDS, and 81 (35.7%) had EPS.

Table 3, Factors associated with functional dyspepsia among population in Aseer region, Saudi Arabia. As for Postprandial Distress Syndrome it was significantly higher among females than males (45.2% vs. 31.4%, respectively;  $P=.048$ ). Considering Epigastric Pain Syndrome, no significant difference was associated with any participants demographic data. About functional dyspepsia, it was significantly higher among females than males (61.8% vs. 44.3%, respectively;  $P=.014$ ). Also, FD was significantly higher among unemployed participants than employed (61.1% vs. 47.4%, respectively;  $P=.049$ ).

**Table 3:** Factors associated with functional dyspepsia among population in Aseer region, Saudi Arabia

| Factors                  | Postprandial Distress Syndrome |       | Epigastric Pain Syndrome |       | Functional dyspepsia |       |
|--------------------------|--------------------------------|-------|--------------------------|-------|----------------------|-------|
|                          | No                             | %     | No                       | %     | No                   | %     |
| <b>Age in years</b>      |                                |       |                          |       |                      |       |
| 15-25                    | 50                             | 45.0% | 40                       | 36.0% | 67                   | 60.4% |
| 26-35                    | 21                             | 36.2% | 22                       | 37.9% | 31                   | 53.4% |
| 36-55                    | 15                             | 45.5% | 12                       | 36.4% | 20                   | 60.6% |
| > 55                     | 7                              | 28.0% | 7                        | 28.0% | 10                   | 40.0% |
| <i>p-value</i>           | .345                           |       | .853                     |       | .274                 |       |
| <b>Gender</b>            |                                |       |                          |       |                      |       |
| Male                     | 22                             | 31.4% | 20                       | 28.6% | 31                   | 44.3% |
| Female                   | 71                             | 45.2% | 61                       | 38.9% | 97                   | 61.8% |
| <i>p-value</i>           | .048*                          |       | .135                     |       | 0.014*               |       |
| <b>Education level</b>   |                                |       |                          |       |                      |       |
| Secondary                | 20                             | 35.7% | 16                       | 28.6% | 26                   | 46.4% |
| University               | 73                             | 42.7% | 65                       | 38.0% | 102                  | 59.6% |
| <i>p-value</i>           | .357 <sup>s</sup>              |       | .201 <sup>s</sup>        |       | .083 <sup>s</sup>    |       |
| <b>Employment status</b> |                                |       |                          |       |                      |       |
| Employee                 | 28                             | 35.9% | 23                       | 29.5% | 37                   | 47.4% |
| Unemployed               | 65                             | 43.6% | 58                       | 38.9% | 91                   | 61.1% |
| <i>p-value</i>           | .261                           |       | .159                     |       | .049*                |       |
| <b>Marital status</b>    |                                |       |                          |       |                      |       |
| Single                   | 50                             | 41.0% | 39                       | 32.0% | 67                   | 54.9% |
| Married                  | 43                             | 41.0% | 42                       | 40.0% | 61                   | 58.1% |
| <i>p-value</i>           | .996                           |       | .208                     |       | .630                 |       |
| <b>Body mass index</b>   |                                |       |                          |       |                      |       |
| Underweight              | 10                             | 52.6% | 4                        | 21.1% | 10                   | 52.6% |
| Normal weight            | 45                             | 35.4% | 45                       | 35.4% | 65                   | 51.2% |
| Overweight               | 32                             | 46.4% | 25                       | 36.2% | 43                   | 62.3% |
| Obese                    | 6                              | 50.0% | 7                        | 58.3% | 10                   | 83.3% |
| <i>p-value</i>           | .271                           |       | .215                     |       | .110                 |       |

P: Pearson X<sup>2</sup> test

§: Exact probability test

\*  $P < 0.05$  (significant)

## DISCUSSION

Functional dyspepsia is a medical condition characterized by recurring indigestion or discomfort in the upper abdomen<sup>14</sup>. The exact cause of functional dyspepsia is unknown, but it is commonly associated with food intolerances, stress, and psychological factors<sup>15</sup>. Treatment options for functional dyspepsia typically involve dietary modifications, stress reduction techniques, and medication. However, because the underlying cause of the condition is often unclear, it can be difficult to manage effectively<sup>16</sup>.

The current study aimed to assess prevalence and factors associated with functional dyspepsia. The study revealed that more than half of the participants fulfilled criteria for functional dyspepsia with less than half had postprandial distress syndrome and one-third had epigastric pain syndrome. Vast majority of the study participants had feeling of fullness during last 6 months which affected their daily activities of less than half of them. Also, most of them had sensation of early satiety which lasted for 6 months among less than half. Considering feeling

of epigastric pain / burning sensation, it was reported among about three-fourths of the study participants which was for last 6 months among less than half of them. A study in Canada, the USA, and the UK showed an average prevalence of 10%, based on the Rome IV criteria which is much less than estimated among current study population, with this proportion ranging from 8% in the UK and Canada to 12% in the USA<sup>17</sup>. In this 61% had postprandial distress syndrome, 18% had epigastric pain syndrome, and 115 21% had both. Another study based on Rom III criteria showed prevalence for FD of 34%<sup>18</sup>. These variations are mainly due to variations in used criteria for diagnosing dyspepsia generally and functional dyspepsia specifically. In studies based on presence of upper abdominal pain as the definition, the prevalence of uninvestigated dyspepsia (UD) has varied between 7% - 34.2%<sup>19-22</sup>. When a wider definition based on upper gastrointestinal symptoms is applied to define dyspepsia, a 23% -45% prevalence was estimated<sup>23-25</sup>. In USA, Shaib and El-Serag managed to endoscope half of a survey participants and obtained a FD prevalence rate of 29.2% (with reflux symptoms) and 15% (without reflux symptoms)<sup>24</sup>. In UK, participants were investigated with either a Barium meal or endoscopy, and an extrapolated FD prevalence of 23.8% was obtained<sup>26</sup>. In another survey 20% of adults had undergone endoscopy with estimated FD prevalence of 11.5%<sup>27</sup>. A prevalence of 14.7% was estimated in a Norwegian survey, where the majority of adults undergone endoscopy<sup>28</sup>. In Japan, Hirakawa et al were able to assess a 17% prevalence of FD in adults undergoing a population gastric cancer screening programme<sup>29</sup>. Also, in Taiwan, the prevalence of FD was documented at 23.8% with Rome I criteria and at 11.8% using the Rome II criteria<sup>30</sup>. In Saudi Arabia, a much lower prevalence was estimated by Zacharakis G et al.<sup>31</sup> where 18.3% satisfied the Rome IV criteria for FD symptoms. Exact of 7.4% had postprandial distress syndrome, 8.1% had epigastric pain syndrome, and 3.4% had the overlapping variant. The prevalence varied from 38.5% in the Al Kharj<sup>32</sup>, 46.5% in Jazzan province<sup>32</sup>, 66.1% in Taif<sup>33</sup>, 60.1% in Jazzan<sup>34</sup> to 86% in Abha, a southern province of Saudi Arabia<sup>35</sup>.

As for risk factors, the current study showed that Postprandial Distress Syndrome was significantly higher among females than males. As for Epigastric Pain Syndrome, no significant difference was associated with nay participants demographic data. About functional dyspepsia, it was significantly higher among females than males and also was significantly higher among unemployed participants than employed.

## CONCLUSIONS AND RECOMMENDATIONS

**In conclusion, the current study estimated high prevalence for FD relative to estimated literature findings but mostly due to variability in used diagnostic criteria. Postprandial distress syndrome was more frequent than epigastric pain syndrome. Females showed higher rates of FD and subtypes than males with unemployment. Future studies are recommended in dyspepsia mainly population-based, but include investigations to categorize the subjects into well-characterized disease subsets; only by this approach will a full understanding of the natural history be possible.**

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**Competing Interest:** None

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